

## ABSTRACT

A heterogeneous ion exchange material is provided which comprises an ion exchange resin incorporated within a binder, the binder comprising a material selected from the group consisting of: (i) a Metallocene catalyzed linear low density polyethylene, (ii) a very low density polyethylene or ultra low density polyethylene processed using either Ziegler-Natta catalysts or Metallocene catalysts, (iii) a thermoplastic elastomeric olefin comprising a polypropylene continuous phase with an ethylene-propylene-diene monomer or ethylene-propylene rubber rubbery phase dispersed through the polypropylene continuous phase, and (iv) a thermoplastic vulcanizate comprising a polypropylene continuous phase with an ethylene-propylene-diene monomer, ethylene-propylene rubber, nitrile-butadiene rubber, natural rubber or ethylene vinyl acetate rubbery phase dispersed through the polypropylene continuous phase. The ion exchange membrane can be manufactured using advanced extrusion techniques, including computer-controlled material feed, computer-controlled automatic die thickness adjustment with independently adjustable lip segments and nuclear gauge detection with feed-back control. It can also be manufactured by injection molding.

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